Setup Guide

hp StorageWorks 700ux/1100ux Optical Jukebox

First Edition (September 2004)

Part Number: AA962-96002

This guide describes procedures for unpacking, installing, configuring, and troubleshooting installation issues for the HP StorageWorks 700ux/1100ux Optical Jukebox.



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About This Guide

This setup guide provides information to help you:

- Unpack the jukebox
- Install and configure the jukebox
- Load media
- Troubleshoot installation issues

“About This Guide” topics include:

- Related documentation, page 6
- Conventions, page 6
- Getting help, page 7

Related documentation

In addition to this guide, HP provides corresponding information:

- *HP StorageWorks Optical 700ux/1100ux Jukebox User's Guide*
- *HP StorageWorks Optical 700ux/1100ux Jukebox Getting Started Poster*
- *HP StorageWorks Optical 700ux/1100ux Jukebox Service Manual*

Conventions

Conventions consist of the following:

- Document conventions
- Text symbols

Document conventions

This document follows the conventions in Table 1.

Table 1: Document conventions

Element	Convention
Cross-reference links	Blue text: Figure 1
Key and field names, menu items, buttons, and dialogue box titles	Bold
File names, application names, and text emphasis	*Italics*
User input, commands and directory names, and system responses (output and messages)	`Monospace font` `COMMAND NAMES` are uppercase monospace font unless they are case sensitive
Variables	*<monospace, italic font>*
Web site addresses	Blue underlined sans serif font text (http://www.hp.com)

Text symbols

The following symbols may be found in the text of this guide. They have the following meanings:



WARNING: Text set off in this manner indicates that failure to follow directions in the warning could result in bodily harm or death.



Caution: Text set off in this manner indicates that failure to follow directions could result in damage to equipment or data.

Note: Text set off in this manner presents commentary, sidelights, or interesting points of information.

Getting help

If you still have a question after reading this guide, contact an HP authorized service provider or access our web site: http://www.hp.com.

HP technical support

Telephone numbers for worldwide technical support are listed on the following HP web site: http://www.hp.com/support/.

Note: For continuous quality improvement, calls may be recorded or monitored.

Be sure to have the following information available before calling:

- Technical support registration or contract number (if applicable)
- Product serial numbers
- Product model names and numbers
- Applicable error messages
- Operating system type and revision level
- Detailed, specific questions
- HP StorageWorks Library & Tape Tools support ticket (if applicable)

HP storage web site

The HP web site has the latest information on this product. Access storage at: http://www.hp.com/country/us/eng/prodserv/storage.html. From this web site, select the appropriate product or solution. You can also visit http://www.hp.com/go/udo.

HP authorized reseller

For the name of your nearest HP authorized reseller:

- In the United States, call 1-800-345-1518
- In Canada, call 1-800-263-5868
- Elsewhere, see the HP web site for locations and telephone numbers: http://www.hp.com.

Unpacking

1

This chapter describes the following:

- Selecting an installation site, page 10
- Removing the packing materials, page 12

Selecting an installation site

Select an installation site, noting the environmental considerations (see Figure 1 and Table 2). Sufficient clearance is necessary for installation access.

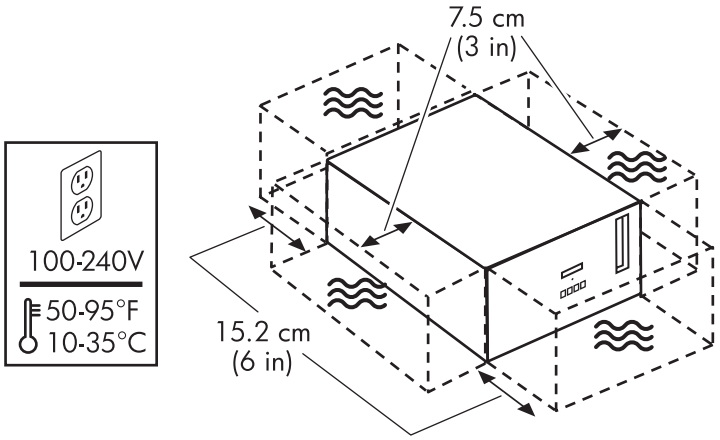


Figure 1: Environmental considerations

Note: Locate the AC outlet near the jukebox. The AC power cord is this product's main AC disconnect device and must be easily accessible at all times.

Table 2: Location criteria

Specification	Description
Clearance	Enough room to comfortably insert disks in the mailslot and for service access.
Power requirements	■ Line voltage: 100 to 240 VAC ■ Line frequency: 50 to 60 Hz ■ Power consumption: 560 W maximum
Temperature: ■ Operating temperature ■ Non-operating temperature (without media)	 ■ 10°C to 35°C (50°F to 95°F) ■ -40°C to 60°C (-40°F to 140°F)

Table 2: Location criteria (Continued)

Specification	Description
Humidity: ■ Operating humidity ■ Non-operating humidity (without media)	 ■ 10% to 80% RH ■ 5% to 90% RH
Light	Avoid very bright or concentrated light as it can interfere with the optical sensors.
Air quality **Caution:** Excessive dust and debris can damage optical media and drives.	Minimal sources of particulate contamination. Avoid areas near frequently used doors and walkways, stacks of supplies that collect dust, printers that create paper dust, and smoke-filled rooms.

Removing the packing materials

Remove the 700ux/1100ux jukebox packing materials (see Figure 2 on page 13).

1. Cut the two plastic bands that secure the jukebox and packing materials to the pallet.

WARNING: The plastic bands are under tension and may snap away when cut. Wear safety goggles when cutting the bands.

2. Open the box. Remove the accessory kit and set aside for later use.

WARNING: Do not move the jukebox without additional help or an appropriately rated lift device. The jukebox weights approximately 30 kg (66 lb).

3. Using at least two people, carefully lift the jukebox from the box, and set aside.
4. Remove the two end caps from the jukebox.
5. Remove the antistatic bag from around the jukebox.

Note: Inspect the jukebox for any damage that may have occurred during shipment. Pay special attention to areas behind any scuffs on the anti-static bag. If damage is detected, contact your authorized service representative.

6. Store the packing materials for future shipment.

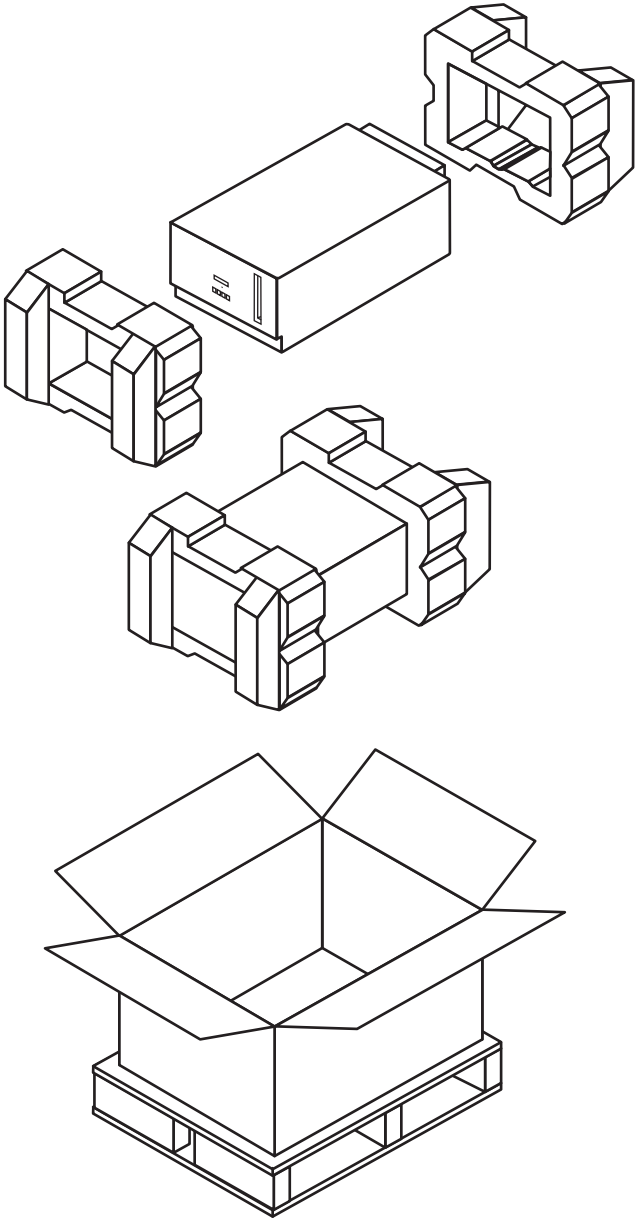


Figure 2: Unpacking the 700ux/1100ux jukebox

Installation

2

This chapter describes the following:

- Identifying product components, page 16
- Identifying panel features, page 18
- Getting connected, page 20

Identifying product components

The components listed in Table 3 may be supplied with the jukebox, depending on the configuration.

Note: Visit http://www.hp.com/go/udo for additional information for your jukebox, including accessories and upgrade options.

Table 3: Supplied accessories

Component	Description
Power cord	U.S. power cord only
SCSI terminator	Low-voltage differential SCSI terminator to terminate the SCSI chain
UDO media	One rewritable 30 GB cartridge, HP part number Q2031A **Note:** HP UDO 30GB Write Once media is also available to order. The part number is Q2030A
Documentation CD	CD containing the user's guide, and web links to product registration, diagnostics and technical support
Getting started poster	Quick reference for preparing the jukebox for operation
Setup guide	Manual includes procedures for unpacking, installing, and configuring the jukebox
Miscellaneous information	May include data sheets, upgrade information, production information, and additional promotions

The components listed in Table 4 are not supplied with the jukebox, but are needed for operation.

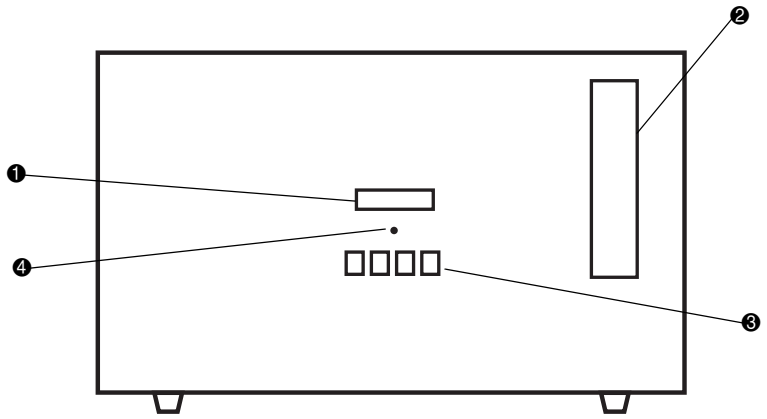
Table 4: Needed components

Component	Description
SCSI cable	High-density 68-pin (Micro D) connector for low-voltage differential interfaces
Host Bus Adapter (HBA)	Low-voltage differential SCSI (LVDS) with a free address for each drive in the jukebox, plus one additional address. For example, an HBA would need 3 free addresses for a 2-drive jukebox. **Note:** The HBA must be dedicated to the jukebox and cannot be shared with other devices. A single-ended (SE) HBA can be used with this LVDS device. However, to ensure optimum performance, HP recommends using an LVDS HBA to take advantage of higher data transfer rates. If an SE HBA is used, the maximum cable length will be limited to 3 meters. **Note:** If the jukebox is placed on a bus with an SE peripheral, the bus will run in SE mode even if the HBA is LVDS. For a 10-drive jukebox, HP recommends one HBA per bus.
Power cord	Localized power cord as required
Application software	Required to operate your jukebox. Consult with your sales representative to identify the software that best meets your needs.

Identifying panel features

Identify the following panel features before you install the jukebox (see Figure 3 and Figure 4 on page 19).

Front panel features and descriptions

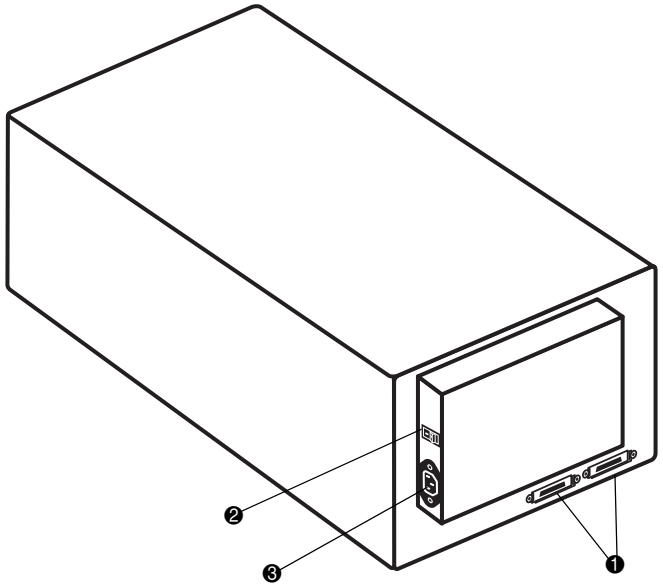


❶ Display
❷ Mailslot
❸ Selection buttons
❹ Activity indicator

Figure 3: Front panel features

- Display—Communicates control panel and status information.
- Mailslot—Used to insert and remove disks from the jukebox.
- Selection buttons—Used to access jukebox menus.
- Activity indicator—Lit to indicate power and drive status, as well as the occurrence of faults.

Back panel features and descriptions



❶ SCSI ports
❷ Power switch
❸ Power receptacle

Figure 4: Back panel features

- SCSI ports—68-pin high-density SCSI connectors (Micro D-type). Used for attaching the SCSI cable from the jukebox to the host computer. One port must have a SCSI cable connected, and the other must have a SCSI terminator connected to it.
- Power switch—Turns power to the jukebox on and off.
- Power receptacle—Used for connecting the power cord to the jukebox.

Getting connected

Caution: Shipping screws must be removed to allow the jukebox to function properly.

1. Remove the two white shipping screws located on the left side of the jukebox (see Figure 5).

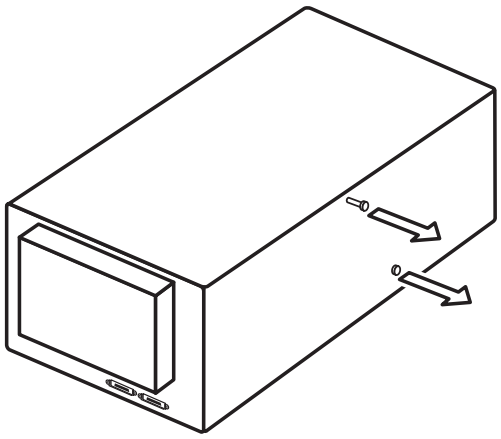


Figure 5: Removing shipping screws

2. Store the screws by attaching them to the back of the jukebox (see Figure 6).

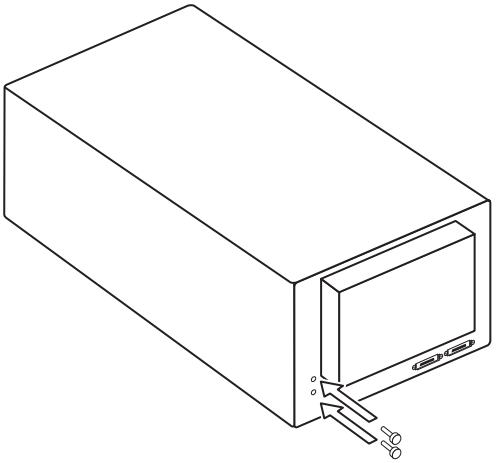


Figure 6: Storing the shipping screws

3. Fill the shipping screw holes with the two black, rubber plugs provided (see Figure 7).

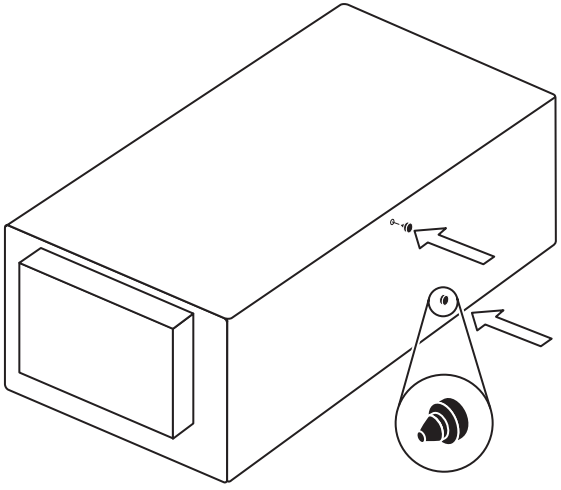


Figure 7: Plugging the holes

Note: For rack mount configurations, refer to the installation procedure provided with the rack mount kit.

4. Connect the jukebox to your host computer and terminate the last device in the SCSI chain (see Figure 8).

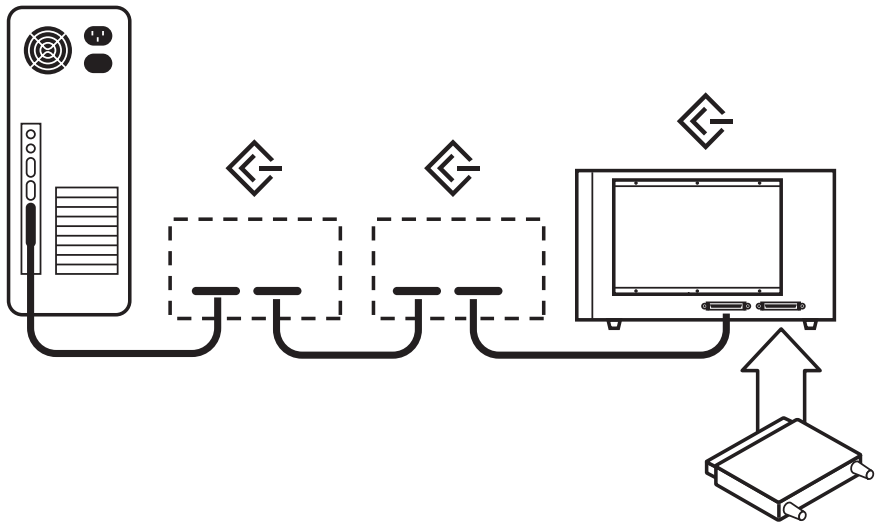


Figure 8: Connecting to the host

WARNING: This product can only be used with an HP approved power cord for your specific geographic region. Use of a non-HP approved power cord may result in: 1) noncompliance with individual, country-specific safety requirements; 2) insufficient conductor ampacity that could result in overheating with potential personal injury and/or property damage; and 3) a fractured power cord, which could cause the internal contacts to be exposed, which potentially could subject the user to a shock hazard. HP disclaims all liability when HP approved power cords are not used.

5. Connect power to the jukebox. Power on the jukebox and then the host system (see Figure 9).

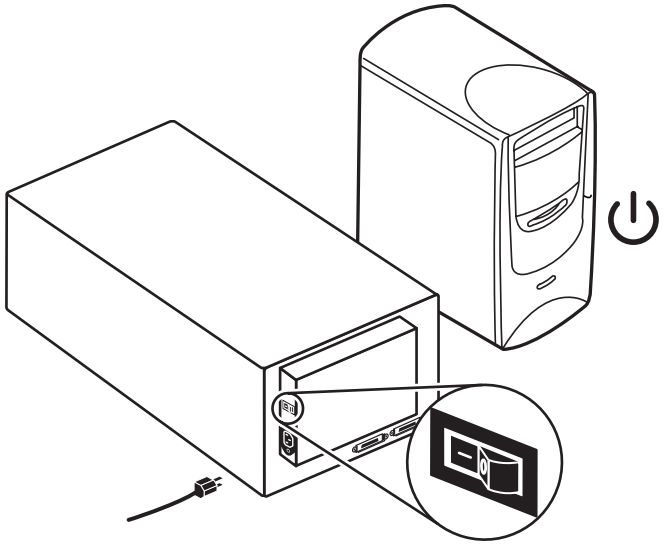


Figure 9: Powering on the jukebox

6. If necessary, set the jukebox and drive SCSI IDs by selecting READY > ADMIN* > SCSI IDS* from the jukebox menu (see Figure 10). Ensure that there are no SCSI ID conflicts with existing devices.

 Default settings:

 - Jukebox = 6
 - Drive 1 = 5
 - Drive 2 = 4

Note: The default administrative password is "000 000 000".

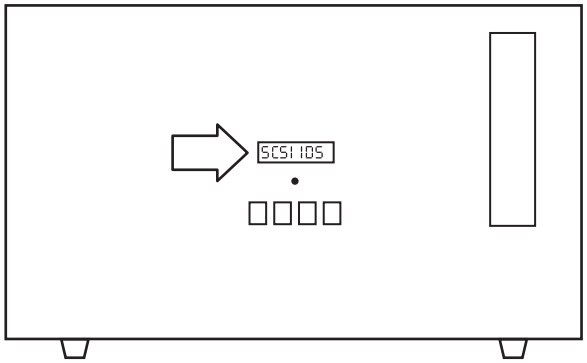


Figure 10: Setting SCSI IDs

Configuration

3

This chapter describes the following:

- Using the jukebox on your host system, page 26
- Loading UDO media, page 30

Using the jukebox on your host system

The following procedures describe how to configure the jukebox with your host operating system.

Note: To use 30-GB disks, your operating system or application software must support 8,192 byte-per-sector media. HP-UX 11.x versions provide this natively with kernel patches as applicable (see "Obtaining HP-UX patches" on page 27).

Connection to Windows 2000 and 2003 Server versions (32- and 64-bit systems)



Caution: To avoid software conflicts due to RSM drivers claiming the device, do not attempt to attach a UDO jukebox to a Windows system before completing the following steps.

The Windows operating systems do not offer any native driver support for the jukebox robotics, or file systems (NTFS) for the 8K sector sized UDO media.

Though native support is not offered by the Windows operating systems, there are important steps required in order for your device to operate correctly, including after third party software has been installed.

1. Disable Removable Storage Manager and reboot the system before attaching the jukebox.
2. Windows 2000 systems require a minimum of Service Pack 4 to be installed as well as Microsoft Hotfix, as described in Knowledge Base Article KB831293. This patch is required for the Windows operating system to recognize an 8K sector sized device.

Note: If you are using a supported software application, the UDF driver for the Windows file system is not required.

Connection to HP-UX (11.x)

The following procedures are for configuring an HP-UX operating system to use native drivers with UDO jukeboxes.

Obtaining HP-UX patches

Your HP-UX system may require software patches to ensure that the standalone UDO drive will install and operate correctly with your system. HP-UX versions 11.0, 11.11 and 11.23 require patches. To view the most up-to-date list of patch requirements, visit http://www.hp.com/go/udo. To download required patches, go to http://www.hp.com/go/support or refer to your HP-UX documentation for patch locations.

Note: HP-UX versions 11.x provide limited native support for jukeboxes, including file system support for rewritable media and a SCSI driver (`schgr`) for the jukebox robotics.

Note: When using a third party application, HP recommends you consult with the application vendor for configuration requirements and recommendations.

Installing the schgr driver

The `schgr` driver is an HP-UX native SCSI driver that allows commands to be sent to a media changer.

1. Log on to the system as root.
2. Initialize SAM by typing `sam` at the command line.

Note: If you are not familiar with using SAM, consult your HP-UX documentation.

3. Select the following items from the menus that are displayed:

- Kernel Configuration
- Drivers

4. Scroll down to the entry “schgr”.

5. Verify that the current state column shows the driver as “out”. If the state is listed as “in”, skip the remaining `schgr` installation steps.
6. Highlight “schgr”. From the **Actions** menu select **Add Driver(s) to Kernel**.
7. Verify that pending state column is now listing “in”.
8. Return to the **Actions** menu and select **Process New Kernel**. This will install the driver, rebuild the kernel, and request a reboot of the system in order to move the kernel into place.

Formatting and mounting UDO rewritable disks

After loading the drive with media from the Operator Control Panel (OCP) or by using the HP-UX MC utility, you can format and mount the media as you would any other disk drive in HP-UX.

1. Identify the SCSI address of the desired drive by inspecting the output of `ioscan-fn`:
 a. Scroll through the `ioscan` output and look for the entry “AA961A” in the **Device Description** column.
 b. Look for the corresponding `/dev/rdsk` and `/dev/dsk` entries.

Note: If the /dev/rdsk and /dev/dsk entries are not listed, it may be necessary to perform an “insf -e” to build the appropriate device files.

 c. Record the device file information listed, such as:

disk 4 0/6/0/0.0.0 sdisk CLAIMED DEVICE HP AA961A

/dev/dsk/c4t0d0 /dev/rdsk/c4t0d0

2. Format and mount the disk using the bolded device file information shown in the above example.
 a. Create a directory to use as a mount point, such as `mkdir/mnt/UDO`.
 b. Format the disk using the `newfs` command:

      ```
      newfs -F vxfs /dev/rdsk/c4t0d0
      ```

 c. Mount the disk to the directory you created in step 2.a, such as `mount /dev/dsk/c4t0d0 /mnt/UDO`.

Your UDO disk is now formatted and mounted, and can be used on HP-UX.

Connection to Sun Solaris, IBM AIX, Tru-64, and Linux

Use third-party drivers. No native support is available with these operating systems.

Note: For operating systems requiring third party drivers, HP recommends attaching the jukebox to the host with the host powered off. Power on the jukebox and then power on the server.

Loading UDO media

Note: Label all disks before loading them into the jukebox. Some application software packages require that you load and eject disks by using instructions in the software. If you use a software application to manage files in the jukebox, check the software documentation before proceeding with these steps.

1. Select READY > LOAD * from the control panel.
2. Load UDO media into the drive by inserting the disk gently but firmly into the mailslot, shutter end first, and with the side you want to access facing to the right (A or B). See Figure 11.

 An incorrectly inserted disk will be rejected with CART IN WRONG displaying briefly.

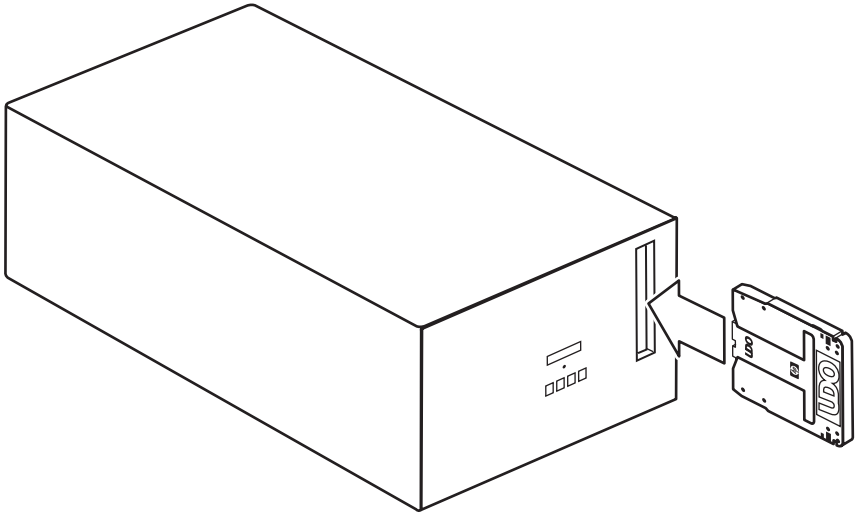


Figure 11: Loading media

3. LOAD SLOT # will display, with # flashing to indicate the number of the first available storage slot in the jukebox. To select this storage slot number, press **LOAD** or **ENTER**. To choose a different storage slot, press **NEXT** or **PREV** until the desired slot number displays, and then press **ENTER**.

4. LOADING displays as the jukebox moves the disk to a slot. After the disk is loaded into the storage slot, LOAD * displays. You can now load additional disks by inserting them into the mailslot and repeating step 3 until you are finished loading disks.
5. Press **CANCEL** to return to the READY state.

Note: For detailed information on using or ordering HP UDO media, refer to the getting started poster and the user's guide that shipped with the jukebox.

Troubleshooting Installation

4

This chapter describes the following:

- Resolving installation issues, page 34
- Using HP StorageWorks Library and Tape Tools, page 36

Resolving installation issues

If the procedures in Table 5 do not address or resolve your problem, visit http://www.hp.com/go/udo for additional assistance, or contact HP technical support (see "Getting help" on page 7).

Table 5: Troubleshooting installation

Problem	Solution
Jukebox will not power on	■ Check that the power indicator light on the control panel is on. If it is not, make sure the power switch on the back panel is on. ■ Replace the power cord.
The power-on selftest failed and `DEVICE FAILED` displays.	■ Ensure the two shipping screws on the left side of the jukebox have been removed. ■ Power cycle the jukebox. ■ If the power-on test continues to fail, write down the displayed error code and micro move error, and contact your support representative.
No display messages appear	■ Ensure that the power cord is connected. ■ Ensure that the power switch is on. ■ Power cycle the jukebox.
Other SCSI devices no longer work when the jukebox is installed	■ Check SCSI ID assignments and resolve any conflicts. ■ Ensure that the SCSI ID for the HBA is different from that of the jukebox. ■ Check for proper SCSI cabling and termination. ■ Ensure the maximum cable length for the bus has not been exceeded (12 meters for LVDS and 3 meters for SE).

Table 5: Troubleshooting installation (Continued)

Problem	Solution
Host computer system does not recognize the jukebox or the drives	■ Ensure the jukebox is not in a error or failed state. If so, troubleshoot the error before continuing. ■ Ensure the jukebox is connected and powered on. The jukebox must be on when booting the host computer for the jukebox to be recognized. ■ Check that the SCSI bus has been terminated and that the maximum cable length has not been exceeded. ■ Check SCSI ID assignments and resolve any conflicts. ■ Ensure you are connected to the correct SCSI bus type. UDO jukeboxes are LVDS devices. ■ If using a narrow (8-bit) HBA, make sure that all addresses are in the range 0 through 7. ■ For Windows operating systems, use the device manager to rediscover the jukebox. ■ For HP-UX, use `ioscan` to verify that the HBA and attached devices are claimed. ■ For other operating systems, refer to the system administrators guide for diagnosing missing peripherals. ■ Check that the application software is compatible with the jukebox. ■ Check that the device is properly installed and configured using HP StorageWorks Library & Tape Tools, available from http://www.hp.com/support/tapetools. ■ Power cycle the jukebox and power down the host. Wait until the jukebox completes its power cycle before powering up the host.

Using HP StorageWorks Library and Tape Tools

HP StorageWorks Library and Tape Tools (L&TT) is a robust diagnostic tool for tape mechanisms, tape automation, magneto-optical and UDO products. L&TT provides functionality for firmware downloads, verification of device operation, maintenance procedures, failure analysis, corrective service actions, and some utility functions. Seamless integration is provided with HP's hardware support organization through generating and emailing support tickets. The support ticket delivers a snapshot, or an in-depth view, of the storage system.

L&TT is a free download from the Web and deploys in fewer than five minutes. It is ideal for customers who want ensured product reliability, self-diagnostics, and faster resolution of device issues.

For more information, visit http://www.hp.com/support/tapetools.

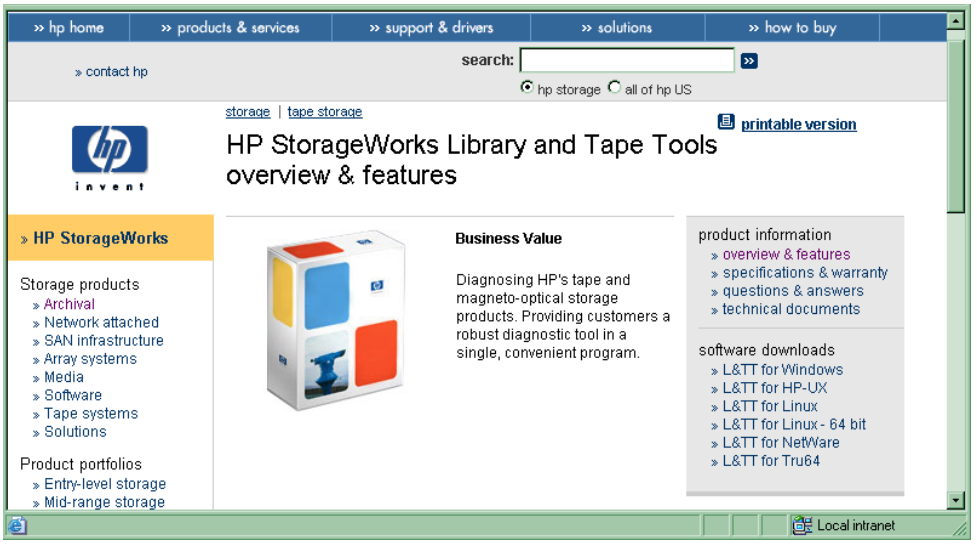


Figure 12: HP StorageWorks L&TT

Glossary

This glossary defines terms used in this guide or related to this product and is not a comprehensive glossary of computer terms.

cartridge
A plastic enclosure that contains an optical disk. The cartridge is labeled “A” and “B” to denote separate sides of the optical disk. The optical disk is never removed from the cartridge.

disk
See optical disk.

driver
A program that allows the operating system to communicate with a peripheral device.

element
A SCSI term for any one of the autochanger components — drive, mailslot, storage slots, or picker.

jukebox
A term synonymous with optical disk library or autochanger. This type of optical storage device is often referred to as a “jukebox” because when a file is requested, the disk containing the file is found, inserted into the drive, and the requested information is sent to the host computer system, similar to the way a musical jukebox finds a recording and moves it to the player when a song is requested.

jukebox controller
The part of the jukebox that controls the sending and receiving of SCSI commands, and controls the disk transport mechanism.

LAN
Local area network. A group of computers and peripherals physically connected so users can share hardware and software resources.

mailslot
The area where disks are inserted and removed from the jukebox.

multifunction drive
An optical disk drive that supports both rewritable and WORM optical disks. The drive detects the disk type by reading a factory-stamped code on the disk, and automatically determines whether to operate in rewritable or WORM mode.

optical disk
A term synonymous with the 5.25-inch optical disk. There are two types of optical disks: rewritable and WORM.

optical disk library
See jukebox.

rewritable optical
An optical disk technology in which data can be repeatedly written using optical reading and writing technology.

SCSI
An acronym for the Small Computer Systems Interface.

storage slot
An autochanger element that holds cartridges when the cartridges are not in a drive or not being ejected through the mailslot.

terminator
A resistor array device used for electrically terminating a SCSI bus. A SCSI bus must be terminated at its two physical ends. A peripheral device uses a terminator only if it is at the end of the bus.

ultra density optical
UDO (Ultra Density Optical), like HP's DVD+RW, uses Phase Change technology in order to achieve increased data density on a 130mm disk. Phase Change technology uses a laser to read and write from the active layer on the disk. The recording process uses the laser to heat each data bit to a specific temperature. One temperature allows the bit to form a crystalline (reflective) mark and a different temperature allows the bit to form an amorphous (less reflective) mark. Data is read by using a low power laser beam to detect the difference in the levels of reflectivity recorded on the disk.

write-once or WORM
An additional operating mode available with multifunction drives. When a write-once (WORM) disk is inserted, the drive will write data, but will not write over data that has been previously written. This feature is useful for applications that need permanent data security and audit trails.

write-protect
A feature that prevents data from being written to a disk. A write-protect tab is located on both sides of the optical disk cartridge to enable write-protection on one or both surfaces of the disk.

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